A UK validation of the Stages of Recovery Instrument

Gavin Weeks, Mike Slade & Mark Hayward

Dr Gavin Weeks

Dr Mark Hayward

Dr Mike Slade

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Abstract

Objective
There is considerable interest in the concept of recovery from psychosis. Consumers describe recovery as a process as opposed to a clinical outcome. However, measures of recovery have an important role in the development of recovery based mental health services. This study sought to investigate the validity and reliability of the Stages of Recovery Instrument (STORI) [1]. This is an Australian measure chosen as a promising measure of recovery developed from the perspectives of consumer accounts.

Method
A questionnaire design was used to investigate the following aspects of validity: face validity and feasibility, concurrent validity, construct validity and test-retest reliability. Fifty people from the caseloads of three specialist mental health teams in a London Borough completed the STORI, the Recovery Assessment Scale [2-3] and a feedback questionnaire. Twenty two people completed the STORI a second time for the purposes of test-retest reliability exploration.

Results
Participants' responses to the feedback questionnaire were mainly positive. This was seen as evidence of face validity and feasibility. Correlations between the STORI and the RAS provided evidence of concurrent validity. Cluster analysis revealed that the STORI items formed three clusters rather than five. Strong correlations between the first and second STORI administrations provided initial evidence for the test-retest reliability.

Conclusions
The STORI can be used to measure recovery concepts in the UK. However, it does not measure the five stage model on which it was based. A three stage model of recovery might best form the basis of future recovery research.

Key words
Recovery, psychosis, validity, reliability

Background

Recovery is "a personal process of overcoming the negative impact of diagnosed mental illness / distress despite its continued presence" (NIMHE, 2004, p2). Supporting recovery is an emerging priority in mental health services internationally. A key scientific challenge is that recovery can be understood both as an outcome and a process.

When considered as an outcome, the aim is to operationalise recovery in order to make it measurable. From this perspective, services and interventions can be evaluated by the extent to which people using them recover. This involves a view of recovery as both binary (present or absent) and invariant across people. Examples include an absence (or significant reduction) of symptoms (such that a diagnosis of psychotic illness could not be made) and an absence of psychiatric hospitalisations for one year (Harrow et al, 2005), two years (Liberman et al, 2002; Whitehorn et al, 2002) and five years (Torgalsboen & Rund, 2002), as well as achieving specified levels of occupational and social functioning (Liberman & Kopelowicz, 2005; Harrow et al, 2005).

Viewing recovery as an outcome facilitates epidemiological research, but has three main shortcomings. First, recovery can take a different time for different individuals. Therefore, determining a length of time that an individual must be, for example, symptom-free may not be appropriate. Second, recovery is not a static construct – individuals experience occasional relapses but these do not necessarily indicate lasting disability. Finally, invariant definitions of recovery do not allow for individual differences. Recovery will mean different things to different people. Some who fit the outcome definition of recovery may be troubled by feeling that they have not achieved their ambitions socially, or may feel stigmatised by their continued use of psychotropic medication. Others who continue to experience a level of symptomatology in excess of the outcome defined criteria, or who occasionally use psychiatric hospitals as a form of respite, may feel that they are achieving things in their life that gives them a positive sense of self, and manage their symptoms in such a way that they are able to continue doing so. These issues lead Davidson and colleagues (2006) to conclude that recovery "*does not have as much to do with level of psychopathology as with how a person manages his or her life in the presence of an enduring illness*" (p7).

In contrast with outcome definitions, recovery has been described as a process individuals go through in order to live a satisfying life despite the limitations of illness (Anthony, 1993). When recovery is conceptualised as a unique, personal journey, it allows for the identification of factors that influence and support people going through this process (e.g. Deegan, 1996; Jacobsen & Greenley, 2001; Repper & Perkins, 2003; Jenkins & Carpenter-Song, 2005). Supporting these processes can then be translated to 'active components' of recovery oriented services (e.g. Care Services Improvement Partnership, 2007; Schrank & Slade, 2007; Shepherd, Boardman & Slade, 2008).

Whilst conceptualising recovery as a process fits with the experience of service users, it does not lend itself to measurement. This is a challenge for recovery practice. In health services that are heavily influenced by measurement (Holloway, 2002), services need to show that they are helping people recover. A challenge, therefore, is to develop an understanding of recovery that stays true to the definition of recovery as a process, but also lends itself to measurement.

One such approach has been proposed by Andresen and colleagues (2003) on the basis of a synthesis of consumer accounts of recovery. They proposed a five stage

model of recovery occurring across four component processes: finding hope; re-establishing a positive identity; finding meaning in life; and taking responsibility for one's own life. Stage 1 is Moratorium - involving a time of withdrawal characterised by a profound sense of loss and hopelessness. Stage 2 is Awareness – a realisation that all is not lost, and that a fulfilling life is possible. Stage 3 is Preparation – taking stock of strengths and weaknesses regarding recovery, and starting to work on developing recovery skills. Stage 4 is Rebuilding – actively working towards a positive identity, setting meaningful goals and taking control of one's life. The final Stage is Growth – living a full and meaningful life, characterised by self-management of the illness and a positive sense of self.

Andresen and colleagues (2003) argue that the fifth stage of recovery represents a measurable outcome. They therefore developed the Stage of Recovery Instrument (STORI) as a means of allocating individuals to their current stage of recovery (Andresen, Caputi & Oades, 2006). Concurrent and construct validity was investigated using an Australian sample of 94 members of a research database. Concurrent validity was demonstrated through positive correlations between scores on the later stages (4 and 5) and measures of hope, well-being, resilience and mental health, along with another measure of recovery, the Recovery Assessment Scale. Evidence of construct validity was provided by a pattern of correlations between scores on each of the five subscales. That is, there were positive correlations between adjacent stages (i.e. Stages 4 and 5), and negative correlations between distant stages (Stages 1 and 5). This provided some initial evidence for the sequential nature of the stages of recovery. However, a cluster analysis found 3 stage-based clusters rather than the expected five. The authors concluded that the STORI was not sensitive enough to yield five stages rather than that recovery is better conceptualised in three stages. The skew in distribution towards later stages of recovery for their sample could account for the inability to identify distinct clusters for earlier stages.

This study aimed to evaluate the STORI with a UK sample.

Methods

Sample

The study was conducted with three specialist mental health teams in Croydon, South London: a Rehabilitation and Recovery Team; an early intervention in psychosis team; and an inpatient recovery unit. These teams were chosen to span the spectrum of people using specialist mental health services, with a full range in the expected contact time with mental health services and levels of complexity of need. The intention was to ensure a wider spread than was available in the self-selecting participant pool from the research database used in the Australian study.

The London Borough of Croydon is a suitable setting for a UK validation study because of the mix in ethnic background and levels of deprivation. The 2001 Office of National Statistics data recorded a population of 330, 587, 63.7% of whom were British, 7.9% Caribbean, 6.5% Irish / other white, 6.4% Indian, 4.4% African and 2.3% Pakistani. Its average Mental Illness Needs Index (MINI: Glover, Robin, Emami & Arabscheibani, 1998) is 100.1, with a range from 81.7 (most affluent electoral ward) to 111.1 (most deprived electoral ward). This indicates that social deprivation levels vary widely within an overall area with average levels for England. This makes the borough a highly nationally representative location. Demographic data

were not given in the Australian validation study. However, it was considered likely that the sample would be culturally different to the sample studied by Andresen and colleagues (2006).

Measures

The STORI is a 50-item self-report questionnaire (Andresen et al, 2006). Ten themes are assessed, each with five items (each ranging from 0 'Not at all true now' to 5 'Completely true now') mapping onto the five proposed stages of recovery. This produces a score for each stage ranging from 0 to 50, and the respondent is allocated to the stage with the highest score. If two stages are tied, then the participant is allocated to the higher stage.

The Feedback Questionnaire was designed for this study to assess face validity and feasibility from the perspective of participants completing the STORI. It contains seven statements (each using a five-point Likert scale) assessing feasibility criteria proposed by Slade and colleagues (1999). Respondents rate agreement with the statements using a five point Likert scale from Strongly agree to Strongly disagree. They then comment on positive and negative aspects of the STORI, including comprehensibility of items.

The Recovery Assessment Scale (RAS) is a 50-item self-report questionnaire comprising 50 statements rated on a five-point Likert scale from 1 to 5 (Corrigan et al, 1999). The resulting single recovery score ranges from 50 (lowest recovery) to 250. The RAS has published psychometric properties and has been subject to large scale factor analysis (Corrigan et al, 2004). It has adequate test-retest reliability and internal consistency. Positive correlations with recovery-related measures of hope, empowerment and quality of life provide evidence of concurrent validity, along with negative correlations with measures of psychiatric symptoms.

Procedure

After giving consent to take part in the study, participants completed the STORI, the feedback questionnaire, and the RAS. At this point, they were able to end their participation or to continue and complete the STORI again, for the purpose of test-retest reliability analysis. If they gave consent to do this, they were given a distracter task for four minutes. The task was the 'digit symbol coding' sub-test from the WAIS, which involved drawing symbols using a key. It was chosen because performing the task requires good concentration, preventing participants from engaging in any rehearsal of their answers. Following the distracter task, they completed the STORI for a second time.

Data analysis

Data were normally distributed, and parametric analyses were used where appropriate.

Concurrent validity was evaluated using Pearson correlations between STORI stage scores and the RAS total score.

Construct validity was investigated in two ways. First, Pearson correlations were conducted between scores in each stage. The stage model of recovery postulates that the five stages are sequential. The ratings of people allocated to stage 1 should be closer to the ratings of people in stage 2 than to people in other stages. Similarly, people in stage 5 should rate closer to those in stage 4 than with people allocated to

other stages. In order to demonstrate this, a particular pattern of correlations was expected. Positive correlations were expected between adjacent stages and weak or negative correlations between more distant stages. Second, a hierarchical cluster analysis using Ward's method investigated whether STORI items cluster into groups mapping on to the five stages of recovery. The cluster analysis was run to identify two, three, four and five cluster solutions and the dendrograms were examined to identify the best solution. Cluster analysis was considered an appropriate means of identifying the extent to which participants completing the STORI fell into groups mapping onto the five stages of recovery proposed by Andresen and colleagues.

Test-retest reliability was investigated using intra-class Pearson correlations to assess the association between participants' STORI stage scores over two administrations.

Internal consistency was investigated by computing Cronbach's alpha scores for each of the five stages. Data were analysed using SPSS Version 15.

An *a priori* power analysis was used to inform the appropriate sample size. Correlation between the STORI and the RAS (power = 0.8; effect size = 0.7; $\alpha = .05$) required a sample size of 43. For the cluster analysis there must be as many sets of data as questions in the questionnaire, so 50 participants were necessary.

Ethics

Ethical approval was obtained from the Bromley NHS Research Ethics Committee and the University of Surrey Research Ethics Committee. Research and Development approval was granted by the South London and Maudsley NHS Foundation Trust.

Results

Descriptive data

A total of 52 people participated in the study. Nobody that received information on the study refused to participate. Two participants started completing the questionnaires but were unable to finish. The majority (66% of participants) were male and their ages ranged between 18 and 60 years. Thirty eight of the participants were referrals from community teams and 12 were inpatients. (the rehabilitation unit) the listing of referrals needs to match the referring teams listed under 'sample'. Diagnostic information was gathered from participants' computerised clinical files (for which consent was obtained). There was a range of diagnoses, most of which included psychosis (i.e. schizophrenia, psychotic disorders). Information related to professional descriptions of current symptoms or severity was not collected since the STORI is designed to measure recovery from a consumer perspective. Participants were varied in ethnic backgrounds. Just under half of the sample were white British and the remainder reflected the diversity of the overall population being studied. Detailed demographic and clinical characteristics of the sample can be found in Table 1.

Insert Table 1 here

STORI stage scores and allocations are listed in Table 2. The mean scores for the stages suggest that items within the stage of Moratorium received a lower level of

endorsement and were less relevant to the participants. Consistent with the findings of Andreson et al (2006), the majority of participants were allocated to the later stages of recovery (rebuilding and growth). However, a more balanced profile of allocations was evident across the sample within the current study as a significant minority of participants were allocated to earlier stages of recovery (awareness and preparation).

Insert Table 2 here

Concurrent validity

The mean score on the RAS was 156.8 out of 205 (range = 121 – 199; sd = 21.9). Correlations between the five STORI stages and RAS total score are shown in Table 3. The significant negative correlation between the STORI stage 1 and RAS total score is evidence that people who identify strongly with the early stage of recovery are also likely to be 'less recovered' on the RAS. Conversely, those people who identified with stages 3, 4 and 5 are likely to be 'more recovered' according to the RAS. The pattern of correlations suggests that the stages are sequential in nature.

Insert Table 3 here

Construct validity

The results of the Pearson correlations conducted between scores for each of the five stages are presented in Table 4. The pattern of correlations shows that people identifying strongly with stage 1 items are unlikely to endorse items in the other stages (and are least likely to endorse stage 5 items). In contrast, those people identifying strongly with items in stage 3 and 4 are likely also to identify with stage 5 items.

Insert Table 4 here

Visual inspection of the dendrograms resulting from the cluster analysis indicated that a three-cluster model was the best fit with the data. The dendrograms, as generated by SPSS, can be seen in figure 1 and cluster memberships are summarised in Table 5. Cluster 1 consisted of seven items, all of which were from stage 1; cluster 2 contained 23 items: three from stage 1, nine from stage 2, eight from stage 3 and three from stage 4. Cluster 3 contained 20 items: one from stage 2, two from stage 3, seven from stage 4 and all ten items from stage 5. To investigate concurrent validity of these three stages, cluster scores were computed for each participant. Because the clusters had uneven numbers of items, the mean score for items within each cluster was used. Pearson correlations were then conducted between the clusters and the RAS. This showed the expected pattern of correlations. That is, there was a significant negative correlation between Cluster 1 and the RAS (-.643; $p<.001$), a moderate and significant positive correlation between Cluster 2 and the RAS (.323; $p<.005$) and a strong and significant positive correlation between Cluster 3 and the RAS (.745; $p<.001$).

Insert Figure 1 here
Insert Table 5 here

Stability

Cronbach's Alpha was calculated for each of the five stage subscales. Alpha values for the five stages were between 0.81 and 0.87. These are all above 0.8, indicating adequate internal consistency (Kline, 2000).

Test-retest reliability was assessed using data from 22 participants who completed the STORI for a second time after completing a four minute distracter task. The remainder of the 50 participants declined to complete the STORI for a second time. Pearson correlations between participants' stage scores were 0.96 for stage 1 ($p<.001$ level); 0.9 for stage 2 ($p<.001$); 0.91 for stage 3 ($p<.001$); 0.92 for stage 4 ($p<.001$) and .95 for stage 5 ($p<.001$).

Face validity and feasibility

The Feasibility Questionnaire was completed by 49 participants, the results of which are shown in Table 6. The table shows the breakdown of responses to questions addressing each of the themes addressed by the feasibility questionnaire.

Insert table 6 here

Discussion

This study offers evidence to suggest that the STORI is a valid and reliable measure when used in the UK. Correlations between the STORI stages and the RAS total score are evidence of the concurrent validity of the STORI, and feedback from participants provided evidence for the face validity and feasibility of the STORI. Correlations between stage scores within the STORI provided initial evidence for the construct validity of the STORI as a measure of the five stage model of recovery. However, the cluster analysis found only three clusters. STORI stage scores showed acceptable test-retest reliability and internal consistency.

This study provided evidence for psychometric properties that were not assessed by Andresen et al (2006). Using the Feedback Questionnaire, there was evidence of face validity and feasibility of the STORI as a measure of recovery from the perspective of service users. Feasibility was investigated using five criteria proposed by Slade and colleagues (1999). Brevity was adequate: the large majority of the participants thought that the STORI was an acceptable length at about 11 minutes. The measure was simple to use, with 84% of participants stating the STORI were easy to understand. Relevance was shown by the majority (75%) of participants agreeing that the questions in the STORI are important for thinking about recovery. Only 5% of participants felt that there were questions in the STORI that they did not wish to answer. Therefore it is concluded that they found it acceptable. A majority of the participants thought that completing the STORI had helped them think about their recovery, providing inconclusive evidence of the personal value of the measure. However, it is notable that 80% thought that the STORI could be used by staff to think about how they help service users.

There was initial evidence for the test-retest reliability of the STORI stages. This was, however, limited by the use of an in-session distracter task that is unlikely to have eliminated practice effects.

Consistent with the initial validation study (Andresen et al, 2006), the pattern of correlations with the RAS provided evidence of concurrent validity of the STORI. There were strong positive correlations between stage 4 and 5 scores and the RAS

total score, and significant negative correlations between the RAS and stage 1. The correlation between stage 2 and the RAS was positive but weak and non-significant. There was a moderate correlation between stage 3 and the RAS. This pattern of negative to positive correlations through the five stages can be taken as indication of the concurrent validity of the later stages of STORI as measures of recovery. However, there was a very small difference in the magnitude of the stage 4 and 5 correlations with the RAS. Furthermore, there was a significant positive correlation between stage 3 scores and the RAS. In the original validation (Andresen et al, 2006), there was no correlation between stage 3, and a weak correlation between stage 4, and the RAS. This would lead to the question of whether these items capture distinctly different stages of recovery, or are tapping into the same processes as the stage 5 items.

The three stage model derived from the cluster analysis compliments the pattern identified by Andresen and colleagues (2006). The pattern within the three clusters was also similar: cluster 1 in that study contained all 10 stage 1 items; the second cluster contained 24 items: all of stages 2 and 3 plus 4 from stage 4; and the third cluster contained 16 items: the remaining six from stage 4 and all of stage 5. This study, therefore, has provided evidence that, whilst the correlations between the five stages in the STORI and the RAS show the expected sequential pattern, they do not form distinct clusters that reflect a robust measure of the five stage model.

The question remains, however, whether the five stage model of recovery is a valid one (and the STORI is not a valid measure of it) or whether recovery is better described in terms of three stages. There is evidence of three stage models in the recovery literature (Baxter & Diehel, 1998; Young & Ensing, 1999; Spaniol et al, 2002), and these informed the analysis through which the five stage model of recovery was developed. Similar to Andresen and colleagues (2006) it is concluded that further development is necessary in order for the STORI to distinguish between five stages of recovery. However, at present, a consideration of the evidence from both the UK and Australia arguably leads to the conclusion that three stages of recovery can be identified using measures and, therefore, that a three-stage model could form the basis of further research into stages of recovery. The clinical implications of a validated stage model of recovery are that interventions can be tailored to the individual. Just as motivational interviewing is a more helpful approach than a detoxification programme for substance abusers who are pre-contemplative of change, it may be that (for example) raising expectations about taking responsibility for one's life is toxic for people in the Moratorium stage and beneficial in the Awareness stage.

Efforts to measure recovery also raise conceptual issues. Evidence-based medicine is primarily modernist. In relation to measurement, it emphasises reliability to reduce measurement error and validity to ensure the intended underlying construct is what is measured. This contrasts with the recovery approach, which is somewhat aligned with a post-modern perspective in its emphasis on personal values and subjective perspectives, plural truths and individualised personal outcomes. These tensions are being addressed more explicitly in the academic literature, (Fisher & Happell, 2009), and well-developed proposals for reconciling this apparent contradiction are being put forward (Silverstein & Bellack, 2009). For example, the use of an invariant primary outcome for all participants in a clinical trial does not capture the individual nature of recovery, and innovative approaches to individualising clinical end-point measurement are now being evaluated in the REFOCUS Study (www.iop.kcl.ac.uk/departments/?locator=1073).

A strength of this study is that it is a demonstration that it is possible to measure recovery concepts in UK clinical services. In an era of evidence-based practice (Holloway, 2002) it has been argued that being able to measure recovery concepts is essential in order for the concepts to have a lasting effect upon the delivery of services (Slade & Hayward, 2007; Schrank & Slade, 2007). However, the idea that recovery should be measured has been criticised by authors who argue that focussing on outcomes does not fit with concepts of recovery as a process and therefore represents an unwelcome development (e.g. Bonney & Stickley, 2008).

There are some limitations to the present study, one of which is the skewed spread of stage allocations. Similar to the original validation study, the latter stages of recovery were more populated than stages 1 and 2. There are a number of explanations for this. First, it is possible that the skew in allocations was a reflection of the study population, i.e. that most people were in the advanced stage of recovery. It is notable that most of the participants came through the community teams – further research might look into the spread of stage allocations in consumers who are inpatients or very recently discharged from hospital. Second, the participants may have identified the socially desirable answers (i.e. those that reflect the latter stages of recovery) and responded accordingly. Third, the skew may reflect a feature of the STORI itself. For example, that the questions designed to reflect stages 2 and 3 are worded very similarly and therefore participants respond similarly to both and are allocated the later stage. These concerns can be addressed by re-wording STORI items that loaded onto the same clusters in the cluster analysis and conducting a new validation study. Fourth, the study would have benefited from a larger sample size. In particular, this would have allowed for a more robust cluster analysis. However, time limitations prevented the recruitment of more participants.

Taking the above findings into account, the STORI cannot be used in its present form to allocate individuals to stages of recovery. The failure of both the original validation and this study to find five stage-based clusters could be seen as evidence that the five stage model is not a valid conceptualisation of recovery. This is a new area of research, with several stage models proposed (e.g. National Institute for Mental Health in England, 2004), some of which emphasise that recovery processes are non-linear. It has been proposed that the metaphor of a spiral may be more helpful than linear stages, as often individuals re-visit earlier stages before progressing on to later stages (Slade, 2009). This complexity is addressed in other measures, such as the Recovery Outcomes Star (National Institute for Mental Health in England, 2008). Future research should focus on the development and psychometric analysis of a shorter version based on a three-stage model of recovery.

Despite the shortcomings of the STORI, it remains a promising measure of the user-defined recovery concept. Developing and using recovery measures in routine clinical services is an important component of the transformation from an evidence-based treatment system to an evidence-based recovery system. Measures such as STORI have at least four potential clinical uses (Slade, 2009). First, identifying the current stage of recovery can inform clinical decision-making about the most appropriate intervention. Second, aggregated data can provide a more recovery-sensitive measure of casemix. This can be used for work-force planning, to better match the skill-mix in a team with the needs of people on the team caseload. Third, using an explicitly recovery-oriented measure such as STORI is one approach to shifting the culture of care: talking about recovery is in itself an intervention. Finally, stage 5 scores could be tracked over time as recovery-focussed outcome data. Overall,

given the positive feedback from participants, the measure could be used as a means of promoting recovery ideas in clinical services.

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Table 1 Demographic and clinical information

Characteristic	N
Age, mean (standard deviation)	32.4 (12.1)
Men, *n* (%)	33 (66)
Ethnicity, *n* (%)	
White	
British	24 (48)
Non-British	5 (10)
Black	
African	7 (14)
Caribbean	7 (14)
Other	1 (2)
Asian	3 (6)
Other	3 (6)
Immigration status	
British	38 (76)
Permanent UK resident	9 (18)
Seeking asylum	3 (6)
Highest Educational Level, *n* (%)	
Degree or equivalent professional qualification	1 (2)
School leaving exams or subsequent equivalent (e.g. National Vocational Qualification)	35 (70)
Basic literacy skills	13 (26)
Unknown	1 (2)
Living arrangements, *n* (%)	
Living alone	10 (20)
Living with other adults	22 (44)
Living with family	16 (32)
Living with partner	2 (4)
Housing Status	
Independent permanent accommodation	24 (48)
Temporary accommodation	2 (4)
24-hour supported accommodation	18 (36)
Other supported accommodation	6 (12)
Employment Status, *n* (%)	
Open market employment	5 (10)
Sheltered employment	4 (8)
Not employed (student)	6 (12)
Primary Diagnosis, *n* (%)	
Schizophrenia	21 (42)
Other psychotic disorders	11 (22)
Mental / behavioural disorder due to alcohol / drugs	6 (12)
Bipolar affective disorder	5 (10)
Depression	3 (6)
Obsessional disorders	2 (4)
Schizoaffective disorder	1 (2)
Emotionally unstable personality disorder	1 (2)
Service, *n* (%)	
Early Intervention service	19 (38%)

Rehabilitation and Recovery Team	19 (38%)
Rehabilitation unit	12 (24%)
Length of Contact, *n* (%)	
First year of contact	8 (16%)
Between 1 and 2 years contact	4 (8%)
Between 2 and 5 years contact	20 (40%)
More than 5 years contact	18 (36%)
Not employed (due to illness)	35 (70)

Table 2 Stage allocations for the STORI (n=50)

	Current study (N=50)	Andresen et al (2006) (N=94)
Stage scores, mean (st dev)		
1 – Moratorium	19.9 (10.2)	
2 – Awareness	28.4 (11.3)	
3 – Preparation	28.5 (10.4)	
4 – Rebuilding	32.4 (10.3)	
5 – Growth	31.4 (11.1)	
Stage allocation, *n* (%)		
1	4 (8)	8 (9)
2	11 (22)	2 (2)
3	5 (10)	5(5)
4	14 (28)	30 (32)
5	16 (32)	48 (51)

Table 3 Correlations between STORI stage scores and RAS total score

Stage, correlation with RAS (significance); $n = 50$	
1	-.640 (p<.001)
2	.138 (p = .340, ns)
3	.458 (p<.001)
4	.671 (p<.001)
5	.735 (p<.001)

Table 4 – correlations between stages of the STORI

	Stage 2	Stage 3	4	5
Stage 1	.183 (p = .205, ns)	-.154 (p=.285, ns)	-.429 (p <.005)	-.479 (p<.001)
2		.794 (p<.001)	.518 (p<.001)	.341 (p<.001)
3			.844 (p<.001)	.705 (p<.001)
4				.863 (p<.001)

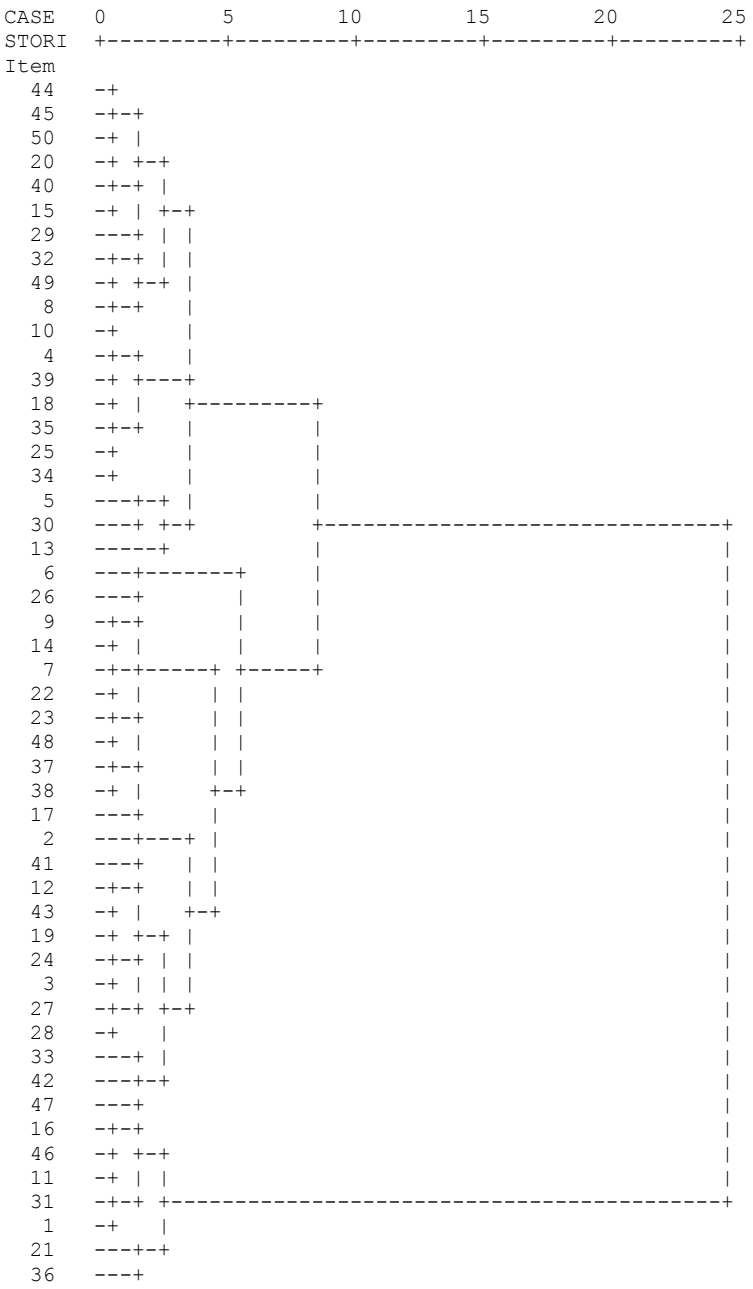
Table 5 Summary of cluster analyses

2 Clusters	1	2			
Cluster Membership (stage)	1,11,16,21,31,36,41,46 (stage 1 items) 2 (stage 2 item)	6,26 (stage 1 items) 7,12,17,22,27,32,37,42,47 (stage 2 items) 3,8,13,18,23,28,33,38,43,48 (stage 3 items) 4,9,14,10,19,24,29,34,39,44,49 (stage 4 items) 5,10,15,20,25,30,35,40,45,50 (stage 5 items)			
3 Clusters	1	2	3		
Cluster Membership (stage)	1,11,16,21,31,36,46 (all stage 1)	6,26,41 (all stage 1) 2,7,12,17,22,27,37,42,47 (all stage 2) 3,8,23,28,33,38,43,48 (all stage 3) 14,19,24 (all stage 4)	32 (stage 2) 13,18 (stage 3) 4,9,29,34,39,44,49 (stage 4) 5,10,15,20,25,30,35,40,45,50 (stage 5)		
4 Clusters	1	2	3	4	
Cluster Membership (Stage)	1,11,16,21,31,36,46 (stage 1 items)	41 (stage 1 item) 2,7,12,17,22,27,32,37,42,47 (stage 2 items) 3,8,23,28,33,43,48 (stage 3 items) 14,19,24 (stage 4 items)	13,18,38 (stage 3 items) 4,9,29,34,39,44,49 (stage 4 items) 5,10,15,20,25,30,35,40,45,50 (stage 5 items)	6,26 (stage 1 items)	
5 Clusters	1	2	3	4	5
Cluster Membership (stage)	1,11,16,21,31,36,46 (stage 1 items)	41 (stage 1 item) 2,12,27,42,47 (stage 2 items) 3,28,33,43 (stage 3 items) 19,24 (stage 4 items)	13,18 (stage 3 items) 4,9,29,34,39,44,49(stage 4 items) 5,10,15,20,25,30,35,40,45,50 (stage 5 items)	6,26 (stage 1 items)	7,17,22,32,37 (stage 2 items) 8,23,38,48 (stage 3 items) 14 (stage 4 item)

Table 6 Feasibility of STORI (n=49)

n (%)	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
1. Easy to understand	1 (2)	2 (4)	5 (10.2)	29 (59.2)	12 (24.5)
2. Helped me to think about my recovery	0 (0)	7 (14.3)	15 (30.6)	19 (38.8)	8 (16.3)
3. Items are important for thinking about recovery	0 (0)	2 (4.1)	11 (22.4)	27 (55.5)	9 (18.4)
4. Too long	5 (10.2)	34 (69.4)	6 (12.2)	4 (8.2)	0 (0)
5. Questions I did not wish to answer	10 (20.4)	30 (61.2)	7 (14.3)	2 (4.1)	0 (0)
6. Prepared to fill in at different times	0 (0)	5 (10.2)	8 (16.3)	25 (51.0)	11 (22.4)
7. Helpful for staff	1 (2.0)	0 (0)	9 (18.4)	27 (55.1)	12 (24.5)
Completion time, mean (minutes) (s.d.)	11.4 (4.86)				

Figure 1 Dendrogram – 3 cluster



Dr Gavin Weeks
University of Surrey, Guildford, Surrey, GU2 7XH

Dr Mark Hayward
University of Surrey & Sussex Partnership NHS Foundation Trust

Dr Mike Slade

Health Service and Population Research Department (Box P029)
Institute of Psychiatry, King's College London
Denmark Hill, London SE5 8AF

Correspondence to:
Dr Gavin Weeks
c/o University of Surrey
Tel 07877647587